



## Defense Health Agency (DHA) Clinical Communities Speaker Series (CCSS)

### 2025 SEP CCSS: Healthcare Innovation and Readiness: Empowering Change and Resilience in Global Care Delivery

#### S02: Blood, Beds, and Plasma: Urgent Needs for the Future Operating Environment

##### Resource List

A reliable, accessible, and high-quality blood supply is critical for the sustainment of any healthcare system. World events such as the COVID-19 pandemic have proven that maintaining the supply of blood presents a logistical challenge. The current blood supply is overseen by extensive donor programs around the world. In the United States, as in other countries, the need for blood has increased, with a decline in blood donations and increasing exclusions for blood donor qualification. While there is a need to improve blood donation participation, there is also need for new alternatives to traditional donation to ensure readiness to treat hemorrhagic shock common in the setting of trauma, as often occurs during a natural disaster or conflict. These operational medicine scenarios require significant blood availability which may tax the current blood supply chain. Aside from a walking blood bank (WBB) model for blood collection in suboptimal conditions, researchers have proposed alternatives for blood that include the manufacturing of blood from stem cell sources. Other alternatives include synthetic liquids that can carry oxygen such as Perfluoro-Chemicals (PFCs) and hemoglobin-based oxygen-carrying systems (HBCOs). [Progress in Development of Functional Biological and Synthetic Blood Products to Augment Transfusable Blood Supply in Operational Medicine](#) (2025) reviews some of these alternatives to the traditional donor blood model. Researchers now have the technology that makes it feasible to develop blood alternatives that one day may supplement and help alleviate the limitations in blood supply.

[How to Provide a Sufficient Supply of Safe, Effective and Quality-assured Blood and Blood Components in Emergency Situations](#) (2025) concluded to adequately respond to emergency situations in medicine it is important to prevent multiple tissue and organ failure by maintaining perfusion of tissues and organs. This can be secured maintaining a low blood viscosity by infusing crystalloids or plasma replacement fluids to allow red cells to deliver oxygen. To respond adequately to emergency situations health care institutions and blood establishments need an emergency preparedness plan based on a risk assessment and gap analysis, emergency preparedness protocol and response and recovery protocol.

The World Health Organization published a guidance document, [Guidance on ensuring a sufficient supply of safe blood and blood components during emergencies](#) (2023) to assist blood services in the development of national plans to respond to any disaster, major incident or emergency that threatens sufficiency or safety of the blood supply. Such situations can be caused by natural forces, by factors influenced by humans or directly caused by humans. This document is intended to guide the national blood service through the process of planning how to respond in a timely, controlled and appropriate way to emergencies. In the preparation of the document, WHO has tried to include the elements that blood services or providers might need to consider, providing some background on the reasons for their inclusion and guidance on different response options that may be available.



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### References

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Smit Sibinga, C. Th. (2025). How to provide a sufficient supply of safe, effective and quality-assured blood and blood components in emergency situations. *Journal of Clinical Haematology*, 6(1), 17–27. <https://doi.org/10.33696/haematology.6.065>

World Health Organization. (2023, April 14). *Guidance on ensuring a sufficient supply of safe blood and blood components during emergencies*. Health Product Policy and Standards.

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